

REMARKS

In response to the Office Action dated December 11, 2009, reconsideration and allowance of the present application are respectfully requested. Claims 1-11 remain pending.

In numbered paragraph 4 on page 2 of the Office Action, a minor objection is raised with regard to claim 1. By the foregoing amendment, this objection has been addressed, and additional amendments have been proposed to clarify the claim language by better conforming to U.S. practice and format.

On page 2 of the Office Action, claims 1, 2, 6 and 7 are rejected under 35 U.S.C. §102(b) as being anticipated by ABB's commonly owned DE 201 07 112 U1. On page 4 of the Office Action, claims 1-11 are rejected as being anticipated by U.S. Patent Publication No. 2002/0145538 A1 (Bocko). On page 7 of the Office Action, claims 3-5 and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the German document in view of the Bocko publication.

The foregoing rejections are respectfully traversed, as the documents relied upon by the Examiner fail to disclose an arrangement comprising a thermoelectric transducer in or on a field service outside a pipeline carrying process media being monitored by the field device, as presently claimed.

Applicant's Figure 1 shows an exemplary field device 10, such as a temperature measurement device, with a housing 11, for monitoring a technical process in a process installation in which there are pipelines 1 which carry process media 1a. The field device has a wire-free communication interface 5. The field device includes at least one field device face 11a facing the process media 1a and at least one field device face 11b facing away from the process media. A

thermoelectric transducer 14 has a transducer face 14b facing the process media 1a and a transducer face 14c facing away from the process media, the thermoelectric transducer 14 being arranged in or on the field device 10 outside the pipeline 1 carrying the process media. The thermoelectric transducer converts at least one of heat flow in the field device between the field device face facing the process and the field device face facing away from the process, and heat flow through the thermoelectric transducer between the transducer face facing the process and the transducer face facing away from the process, to electrical energy for supplying electrical power to the field device.

The foregoing embodiment is encompassed by Applicant's claim 1, which recites an arrangement comprising: a field device with a housing, for monitoring a technical process of a process installation in which there are pipelines which carry process media, the field device having a wire-free communication interface and having at least one field device face facing the process and at least one field device face facing away from the process. Claim 1 also recites a thermoelectric transducer having a transducer face for facing the process and a transducer face for facing away from the process, the thermoelectric transducer being arranged in or on the field device outside the pipeline carrying the process media, for converting at least one of heat flow in the field device between the field device face facing the process and the field device face facing away from the process, and heat flow through the thermoelectric transducer between the transducer face facing the process and the transducer face facing away from the process, to electrical energy for supplying electrical power to the field device.

None of the documents relied upon by the Examiner disclose such a combination of features. The commonly assigned DE '112 document of ABB is discussed on pages 1-3 of the present specification, wherein page 2, lines 13 et seq. state:

The thermoelectric transducer in the device according to DE 201 07 112 U1 is in this case formed from a thermocouple between two sensing points, with the first sensing point projecting through the wall of the pipeline of the technical process into the process medium, and the second sensing point being located within or outside the field device, in each case at the ambient temperature level. However, an arrangement such as this results in the difficulty that the first sensing point, which projects into the process medium, of the thermoelectric transducer must be particularly protected against corrosion and contamination, thus adversely affecting the heat, so that, in particular, the heat transfer from the medium to the sensing point, and thus the efficiency of the thermoelectric transducer become worse over the course of time. Furthermore, fitting of the thermoelectric transducer with its sensing point end into the interior of the process medium represents considerable design complexity; there are also some locations in which field devices are used in process installations in which it is completely impossible for a component to be immersed directly in the process medium, for installation reasons. Furthermore, the efficiency of a thermoelectric transducer which makes use of the temperature difference between two media at different temperatures is, of course, restricted. The capability to use a power supply device according to DE 201 07 112 U1 is thus severely restricted in practice.

DE '112 does not disclose a thermoelectric transducer as recited in Applicants' claim 1, wherein a thermoelectric transducer is arranged in or on a field device outside a pipeline carrying process media being monitored, for supplying electrical power to the field device.

The Bocko document also fails to disclose Applicants' claim 1 combination, and/or overcome the deficiencies of ABB's DE '112 document, even when considered in combination with the DE '112 document in the manner asserted by the Examiner.

Referring to Fig. 12 of the Bocko document (as cited by the Examiner), a system is illustrated which includes a sensor 60, and a control and power storage module 42. However, the Bocko document, even when considered in combination with the DE '112 document, does not disclose or provide any reason to include a thermoelectric transducer arranged in or on the field device outside a pipeline carrying process media being monitored, as presently claimed.

Bocko's sensor system 10 (Fig. 1) shows the sensor module 60 and a power supply module 20. Fig. 9 of the Bocko document illustrates the power supply module 20 as including a base 22 and thermoelectric modules 30 mounted between base 22 and passive radiator 50. (See Para. [0055]). The base 22 is heated by a mechanical, electrical or chemical process (see Para. [0058]). Fig. 12 of the Bocko patent shows a control and power storage module 42 that is located within the power supply module 20 (see page 4 of the Bocko document, at paragraph [0061]). The output of the control and power storage 42 is supplied to the sensor 60, which can communicate via a communication module 120.

The Bocko document does not disclose a field device with a thermoelectric transducer arranged in or on the field device outside a pipeline carrying a process media. At best, the Bocko document discloses that environmental energy can be captured and used to power a sensor, but this is already acknowledged by Applicants as prior art in the discussion of the DE '112 document on Applicants' specification page 1, line 27-page 2, line 4 which states:

In this case, one variant of a power generating and production unit which appears to be particularly advantageous converts non-electrical primary energy that exists in the process in the process installation to electrical energy, with the field device being supplied with electrical power in this way, since this avoids the disadvantage that conventional

primary energy sources, such as batteries, can be exhausted. DE 101 20100 A1 has proposed a system such as this which is used to supply field devices with a wire-free communication device for use in process installations with so-called non-conventional primary energy generators, for example a thermoelectric transducer, by means of which a temperature difference between two media at different temperatures is converted to electrical power.

Thus, any combination of the DE '112 and Bocko document teachings would, at best, have resulted in using a sensor as is already disclosed in the DE '112 document with a pipeline carrying a process medium. Neither of these documents disclose, or provide any reason, for replacing a thermocouple which projects through the wall of a pipeline carrying a process medium of a technical process, with a thermoelectric transducer arranged in or on a field device and presently claimed. The sensor module 60 of the Bocko document is not disclosed as being useable with a pipeline carrying a process medium that has traditionally been monitored with a thermoelectric transducer as disclosed on pages 1-3 of Applicants' present specification with regard to ABB's DE '112 document.

As such, Applicants' claim 1 is allowable.

Independent claim 6, which recites a method for monitoring a technical process and involves a similar field device having a housing equipped with a thermoelectric transducer, is also allowable.

The remaining claims depend from claims 1 and 6 and are also allowable.

All objections and rejections raised in the Office Action having been addressed, withdrawal of the rejection and allowance of the present application is respectfully requested.

Respectfully submitted,

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